

# PATENT SPECIFICATION

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## (54) FOOD PRODUCTS

(71) We, SPECIAL FOOD CORP., a Body Corporate organised and existing under the laws of the Principality of Liechtenstein of 12 Herrengasse, FL-9490 Vaduz, Liechtenstein, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to bakery products and to processes for preparing such products.

In German Offenlegungsschrift No. 2,336,562 there are described a flour mix and its use for producing a low-carbohydrate, high protein bread. The flour mix, which is primarily intended for slimmers, has a protein content of from 15 to 25% by weight and a carbohydrate content of from 10 to 20% by weight. In order to ensure acceptable baking qualities and flavour in products formed using such flour mixes a number of additives may be included. Thus, for this purpose, skimmed milk powder, full cream milk powder, powdered dried curds, powdered dried yoghurt, legume meal, cereal husks and active baking agents are included.

Although the potential of soya beans as a valuable source of food with their high protein and low carbohydrate content has long been recognised, it has hitherto not been possible to use soya beans in the preparation of bakery products such as, for example, bread, in such a way that the valuable nutritional properties are retained whilst still providing acceptable baking qualities and flavour in the product.

Swiss Patent Specification 368367 discloses a process for debittering soya and removing or deactivating the trypsin inhibitor present therein. In addition to elimination of bitter flavours, the removal or deactivation of the trypsin-inhibitor has the advantage that the degradation of valuable proteins is reduced.

It has been found, however, that the use of finely ground debittered soya flour,

which has been treated to substantially remove or deactivate the trypsin-inhibitor, in the preparation of bakery products, whilst eliminating a certain proportion of unpleasant flavours in the bakery product as compared to products prepared using untreated soya flour, does not lead to a completely satisfactory product or to improved baking qualities. We have now found that the baking qualities and, to a certain extent, the flavour of the bakery products, are dependent on the size of the soya particles used in preparing the products.

Thus according to one feature of the present invention there are provided bakery products in the preparation of which debittered soya grits have been used, the trypsin-inhibitor in said soya grits having been substantially deactivated or removed.

According to a further feature of the present invention there is provided a process for the preparation of a bakery product wherein debittered soya grits are used as one ingredient, the trypsin-inhibitor in said soya grits having been substantially deactivated or removed.

We have now found that, by using larger soya particles, the baking qualities and flavour of soya-containing bakery products may be substantially improved. Since it is well known that the use of corn grits instead of fine corn flour in the preparation of bakery products leads to considerably poorer flavour and baking qualities, such a discovery is particularly surprising.

Whilst we do not wish to be limited by theoretical considerations, a possible explanation might be that, with a larger particle size, the specific surface area is substantially smaller than with finely ground flour and thus the apparent quantity of unpleasant flavours present is reduced. Similar considerations may also apply to the improved baking qualities as compared to conventional soya flour. Improved rising of the dough leads, not only to an improved consistency in the

bakery product, but also to an improvement in the flavour. Furthermore, with the bakery products according to the invention, the flatulence generally experienced hitherto on eating soya-containing products is substantially avoided or reduced.

The soya grits for use in the present invention conveniently have an average particles size of at least 0.2 mm and are desirably in the form of bruised or crushed grains. In general the use of larger particles leads to better results in the product. The upper limit for the particle size is fixed by general baking and consistency factors. Preferably the soya grits have an average particle size of from 1 to 8 mm.

In addition to soya grits, soya flour and/or a protein extract, e.g. one obtained from soya beans and preferably in flour form, may be used in the preparation of bakery products according to the invention. In this way the protein content of the bakery product may be increased disproportionately to the soya content. As will be appreciated, the amount of protein extract or soya flour which may be added will, of course, as described above, be limited by the necessity of retaining acceptable baking qualities and flavour. Preferably the protein extract is used in an amount of about 5% of the dry ingredients for normal bakery products whilst, for dietetic purposes, an amount of from 10 to 20% by weight of the dry ingredients is more preferred.

The soya-content of the dry ingredients used in the preparation of bakery products according to the invention is not theoretically critical but is conveniently from 5 to 60% by weight. Preferably the soya-content of the dry ingredients will be from 20 to 40% by weight which, in the case of, for example, bread, leads to a protein content of about 16% by weight in the bakery product. It has been established that protein contents of this order are particularly nutritionally beneficial for normal, healthy humans. For dietetic purposes the protein content can readily be increased, for example to about 30% by weight.

The bakery products according to the present invention may, if desired, contain additives such as, for example, baking agents and/or preservatives. Depending on the desired product additional ballast materials or fillers such as, for example, wheat bran or pulses may conveniently be used.

A particularly preferred bakery product according to the invention is bread in loaf form but other bakery products such as, for example, rolls and salted confectionery e.g.

pretzels may be prepared according to the present invention.

The invention is further illustrated by reference to the following non-limiting Example.

#### Example

A bread product was produced according to conventional methods using water and the following dry ingredients:—

	by weight	
Wheat flour	71%	75
Soya-protein extract	5%	
Bruised soya-grains (de-bittered-trypsin-inhibitor removed)	20%	
Salt	1.5%	80
Baking leavening	2%	
Powdered butter milk	0.5%	

The product had acceptable flavour and other characteristics.

#### WHAT WE CLAIM IS:—

1. Bakery products in the preparation of which debittered soya grits have been used, the trypsin-inhibitor in said soya grits having been substantially deactivated or removed.
2. Bakery products as claimed in Claim 1 wherein the soya grits have an average particle size of at least 0.2 mm.
3. Bakery products as claimed in Claim 2 wherein the soya grits have an average particle size of from 1 to 8 mm.
4. Bakery products as claimed in any of Claims 1 to 3 wherein the soya grits are in the form of bruised or crushed grains.
5. Bakery products as claimed in any of the preceding claims in the preparation of which a protein extract is used.
6. Bakery products as claimed in Claim 5 wherein the protein extract comprises a soya protein extract.
7. Bakery products as claimed in Claim 6 wherein the soya protein extract is in the form of a flour.
8. Bakery products as claimed in any of Claims 5 to 7 wherein the protein extract is used in an amount of from 10 to 20% by weight of the dry ingredients.
9. Bakery products as claimed in any of the preceding claims in the preparation of which soya flour is used.
10. Bakery products as claimed in any of the preceding claims wherein the dry ingredients used to form the products have a soya content of from 5 to 60% by weight.
11. Bakery products as claimed in Claim 10 wherein the dry ingredients used to form the products have a soya content of from 20 to 40% by weight.
12. Bakery products as claimed in any of

- Claims 1 to 11 having a protein content of about 16% by weight. 25
13. Bakery products as claimed in any of Claims 1 to 11 having a protein content of about 30% by weight. 5
14. Bakery products as claimed in any of the preceding claims in the preparation of which additional ballast materials or fillers are used. 10
15. Bakery products as claimed in Claim 14 wherein the additional ballast material or filler comprises wheat bran or pulses. 15
16. Bakery products as claimed in any of the preceding claims containing baking agents and/or preservatives. 20
17. Bakery products as claimed in any of the preceding claims in the form of bread. 25
18. Bakery products are defined in Claim 1 substantially as herein described. 30
19. Bakery products substantially as herein described in the Example. 35
20. A process for the preparation of a bakery product wherein debittered soya grits are used as one ingredient, the trypsin-inhibitor in said soya grits having been substantially deactivated or removed. 40
21. A process as claimed in Claim 20 wherein the soya grits have an average particle size of at least 0.2 mm.
22. A process as claimed in Claim 21 wherein the soya grits have an average particle size of from 1 to 8 mm.
23. A process as claimed in any of Claims 20 to 22 wherein the soya grits are in the form of bruised or crushed grains.
24. A process as claimed in any of Claims 20 to 23 for the preparation of a bakery product as defined in any of Claims 5 to 16.
25. A process as claimed in Claim 20 substantially as herein described.
26. A process as claimed in Claim 20 substantially as herein described in the Example.
- For the Applicants,  
FRANK B. DEHN & CO.,  
Imperial House,  
15-19 Kingsway,  
London, WC2B 6UZ.

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